City of Seattle Amendments to National Fire Protection Association (NFPA) 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition.

Point of Information

To purchase a copy of the NFPA 502, 2001 edition, go to www.nfpa.org or contact your nearest technical book retailer. Be sure to obtain the 2001 edition of NFPA 502 as newer editions may exist.

City of Seattle Ordinance 121524 adopts the 2003 Seattle Fire Code and by reference adopts the National Fire Protection Association (NFPA) 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition.

Sections of NFPA 502 that were amended or repealed are indicated in the excerpts shown below from below from City of Seattle Ordinance 121524. Text that is deleted from the NFPA 502 is shown with strikethrough and enclosed in double parenthesis. Text that was added as a Seattle amendment is shown as underlined. Where an entire section was deleted, it is noted as being repealed.

Subsection 9.1 of NFPA 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is amended as follows:

9.1 Standpipe Systems.

9.1.1 Standpipe systems for road tunnels, bridges, depressed highways, elevated highways, roadways beneath air-right structures, and limited access highways shall be designed and installed ((~~as Class I systems~~)) in accordance with NFPA 14, *Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems* and Chapter 9 of this standard.

9.1.2 Standpipe lines shall be a minimum size of 203-mm (8-in.) and hydraulically designed to provide a minimum of 5760 L/min (1500 gpm) to any two outlets flowing simultaneously. The required flow rate for the standpipe system shall not be required to exceed 5760 L/min (1500 gpm). ((~~1920L/min (500 gpm).~~))

((~~**9.1.3** Standpipe systems shall be either wet or dry, depending on the climatic conditions, the fill times, the requirements of the authority having jurisdiction, or any combination thereof.~~))

9.1.4 Areas Subject to Freezing

9.1.4.1 ((~~Where wet standpipes are required in areas subject to freezing conditions, the water shall be heated and circulated.~~)) Water shall be supplied to the standpipe system by the use of electrically actuated deluge valves installed in locations not subject to freezing, such as in underground vaults.

9.1.4.1.1 Access to the deluge valve vaults and manual actuation capability at the vaults shall be provided.

9.1.4.2 ((~~All piping and fittings that are exposed to freezing conditions shall be heat-traced and insulated.~~)) A deluge valve actuation switch shall be installed at each hose connection outlet location and protected from damage and weather in a box that can be opened without the use of tools or special knowledge, or with a standard hydrant wrench.

9.1.4.3 A means to indicate that the system is in a tripped condition such as a light beacon shall be provided.

9.1.5 ((~~Wet s~~)) Standpipe systems shall be provided with suitable interconnection and bypass valve arrangements to allow the isolation and repair of any segment without impairing the operation of the remainder of the system.

9.1.6* ((~~Dry s~~)) Standpipe systems shall be installed in a manner so that the water is delivered to all hose connections on the system in 10 minutes or less.

9.1.7 ((~~Dry s~~)) Standpipe systems shall have provisions for complete draining after use.

9.1.8 Combination air/relief vacuum valves shall be installed at each high point on the system.

9.1.9 ((~~Dry s~~)) Standpipes shall be installed in a manner that provides accessibility for inspection and repair.

9.1.10 Standpipe systems shall be protected from damage by moving vehicles.

Subsection 9.2 of NFPA 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is amended as follows:

9.2 Water Supply.

9.2.1 ((~~Wet s~~))Standpipe systems ((~~(automatic or semiautomatic)~~)) shall be connected to an approved water supply this is capable of supplying the system demand for a minimum of 1 hour.

((~~9.2.2~~ ~~Dry standpipe systems shall have an approved water supply that is capable of supplying the system demand for a minimum of 1 hour.~~))

9.2.2((~~3~~)) Acceptable water supplies shall include one or more of the following:
(1) Municipal or privately owned waterworks systems that have adequate pressure and

flow rate and a level of integrity acceptable to the authority having jurisdiction
(2) Automatic or manually controlled fire pumps that are connected to an approved water source
(3) Pressure-type or gravity-type storage tanks that are installed in accordance with NFPA 22, *Standard for Water Tanks for Private Fire Protection*

Subsection 9.3.1 of NFPA 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is amended as follows:
9.3.1 Fire department connections shall be of the threaded ((~~two way or three~~)) 65-mm (2½-in.) four-way type. ((~~or shall consist of one 100-mm (4-in.) quick-connect coupling that is accessible to a fire department pumper.~~))

Subsection 9.3.2 of NFPA 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is amended as follows:
9.3.2 ((~~Each independent~~)) The standpipe system shall have a ((~~minimum of two~~)) fire department connection((~~s that are remotely located from each other~~)) installed at each deluge valve vault or at other approved locations.

A new subsection 9.3.2.1 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is adopted to read as follows:
9.3.2.1 Wherever possible, fire department connection locations shall be coordinated with emergency access and response locations.

Subsection 9.3.4 of the National Fire Protection Association Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is hereby repealed.

Subsection 9.4 of NFPA 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is amended as follows:
9.4 Hose Connections

9.4.1 ((~~Hose connections shall be spaced so that no location on the protected roadway is more than 45 m (150 ft) from the hose connection.~~)) An approved valve shall be provided for each standpipe outlet, easily operable from the roadway.

9.4.2 ((~~Hose connection spacing shall not exceed 85 m (275 ft).~~)) The spacing between hose connection outlets on elevated roadways shall not exceed 153 m (500 ft.).

9.4.2.1 Where roadways are provided with median dividers and/or four or more traffic lanes, hose connection outlets shall be provided on each side of the elevated roadway at the required spacing and be arranged on an alternating basis; or may be installed in the median dividers at the required spacing.

9.4.3 ((~~Hose connections shall be located so that they are conspicuous and convenient but still reasonably protected from damage by errant vehicles or vandals~~.)) Hose connection

outlets shall be oriented parallel to the roadway and face in the direction of oncoming traffic where installed along the guardrail or edge barrier.

9.4.3.1 Where hose connection outlets are installed in median dividers, dual outlets shall be required, facing in both directions of travel.

9.4.3.2 Hose connection outlets shall be positioned such that the centerline of each outlet is installed not more than 406-mm (16-in.) horizontally from the inside edge of the top and not less than 203-mm (8-in.) above the top of the guardrail or edge barrier, and not more than 1371-mm (54-in.) above the roadway.

Exception: When outlets are installed in median dividers that are more than 812-mm (32-in.) wide, the 406-mm (16-in.) from the inside edge requirement may be exceeded, and the outlets centered in the median divider.

9.4.4 Hose connections shall have ((~~65 mm (2 ½ in.)~~))100-mm (4-in.) outlets with external threads in accordance with City of Seattle Standard Plan No. 310a. ((~~NFPA 1963, *Standard for Fire Hose Connections*, and the authority having jurisdiction.~~))

9.4.5 Hose connections shall be equipped with caps that are removable with a standard hydrant wrench to protect hose threads.

9.4.5.1 Hose connection caps shall have a 3.2-mm (1/8-in.) predrilled hole for pressure relief and be secured with a short length of chain or cable to prevent falling after removal.

A new subsection 9.6.3.1 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is adopted to read as follows:

9.6.3.1 The location of the deluge valve actuation switch installed at each hose connection shall be readily visible and have appropriate signage.

A new subsection 9.7 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is adopted to read as follows:

9.7 Maintenance and Confidence Testing

9.7.1 Standpipe systems shall be inspected and tested at least annually.

9.7.2 Reports of inspections and tests shall be submitted to the Seattle Fire Department Confidence Testing Unit. Maintenance and periodic testing are the owner's responsibility, or the responsibility of such other person as may be designated, and are separate from fire department inspections.

9.7.3 The person, firm or corporation performing such work shall have a Type STP-1 certificate from the fire department. See Administrative Rules 9.01.04 *Certification for Installing, Maintaining and Testing Life Safety Systems and Equipment* and Administrative Rule 9.02.04 *Confidence Test Requirements for Life Safety Systems*.

Subsection 13.1 of NFPA 502 Standard for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is amended as follows:

13.1* General. This chapter shall apply to the transportation of hazardous materials through road tunnels as follows:

(1)Where tunnel length equals or exceeds 240 m (800 ft) and where the maximum distance from any point within the tunnel to an area of safety exceeds 120 m (400 ft).

(2)Where tunnel length equals or exceeds 300 m (1000 ft).

This chapter shall not apply to:

(1) The existing Mount Baker Tunnel (Interstate-90) and the Washington State Convention and Trade Center lid (Interstate-5) during those periods when the foam-water fire protection system(s) are fully functional and in-service.

(2) Fuel contained in the fuel system of the transporting vehicle, or in the fuel systems of vehicles and equipment being towed or carried.

13.1.1 ((~~The facility operating agency shall adopt rules and regulations that apply to the transportation of hazardous materials.~~)) Flames used for heating vehicles or loads shall be extinguished before the vehicle enters the road tunnel or its approaches.

13.1.2 ((~~A program shall be maintained for enforcing such regulations.~~)) The following classes of hazardous materials as defined by the U.S. Department of Transportation, whether in tank vehicles or containers, are prohibited from being transported through road tunnels:

(1) Class 1 explosives, division 1.1, 1.2, and 1.3;

(2) Class 2, division 2.3 poisonous gas;

(3) Class 4, division 4.3 dangerous when wet materials((;))

(4) Class 6, division 6.1 poisonous materials marked PG I (Inhalation Hazard), or PG III (Stow Away From Foodstuffs),

13.1.3 ((~~In developing such regulations, the following shall be addressed:~~

~~(1) Availability of a suitable alternative route(s) that meets federal requirements as prescribed in Department of Transportation, Title 49, *Code of Federal Regulations*, Part 177.825, "Routing and Training Requirements for Class 7 (Radioactive) Materials," and Department of Transportation, Title 49, *Code of Federal Regulations*, Part 397, Subpart C, "Routing of Non-Radioactive Hazardous Materials"~~

~~(2) Department of Transportation, Title 49, *Code of Federal Regulations*, Subtitle B, Parts 100 to 199~~

~~(3) Fire and accident experience of facilities similar to the facility for which rules and regulations are being adopted~~

~~(4) Previous fire and accident experience on the facility in question and adjacent roads; or, in the case of a new facility, previous fire and accident experience on roads in the area~~

~~(5) Anticipated traffic volumes in peak and off-peak periods~~

~~(6) Need for inspection of vehicles and cargo and the availability of an approved place~~

~~to conduct inspections with a minimum of traffic interference~~

~~(7) Need and desirability of escort service with due consideration of the extent to which it could disrupt the orderly flow of traffic and create additional hazards~~

~~(8) Plan developed by an operating agency in a dense urban area, as referenced in *Hazardous Material Transportation Regulations at Tunnel and Bridge Facilities*. The suitability of such a plan for a given facility shall also be considered.~~))

Tank vehicles which are empty, or which have a residue, or vehicles transporting empty containers are prohibited from entering road tunnels if they previously transported a prohibited hazardous material as set forth in 49 CFR, with the following exceptions:

(1) Tank vehicles or containers that have been sufficiently cleaned of residue and purged of vapor to remove any potential hazard;

(2) Tank vehicles or containers that have been reloaded with a material not classified as a hazardous material;

13.1.4 Tank vehicles used to transport the following hazardous materials, even if empty, are prohibited from entering road tunnels.

- Class 3 flammable or combustible liquids
- Oxygen (Class 2, division 2.2)
- LPG (Class 2, division 2.1)

13.1.5 Vehicles transporting hazardous materials are restricted in road tunnels in accordance with the following:

(1)Class 2, Division 2.1 flammable gas quantities shall not exceed an aggregate of 120 gallons per vehicle and individual container capacities shall not exceed 6 gallons except for LPG. LPG quantities shall not exceed an aggregate of 120 pounds LPG capacity per vehicle and individual LPG containers shall not exceed 60 pounds LPG capacity, (141 pounds water capacity);

(2)Class 3, flammable liquid, having a flash point below 100^{o} F quantities shall not exceed an aggregate of 120 gallons per vehicle and individual container capacities shall not exceed 6 gallons;

(3)Class 3, combustible liquid, formaldehyde solutions shall have individual container capacities not exceeding 100 gallons;

(4)Class 4, division 4.1 flammable solid aggregate quantities shall not exceed 900 pounds per vehicle;

(5)Class 4, division 4.2 spontaneously combustible material aggregate quantities shall not exceed 900 pounds per vehicle;

(6)Class 5, division 5.1 oxidizers, transported in containers shall not exceed an aggregate quantity of 120 gallons or 900 pounds per vehicle and individual container capacities shall not exceed 6 gallons;

(7)Class 5, division 5.2 organic peroxides, transported in containers shall not exceed an aggregate quantity of 120 gallons or 900 pounds per vehicle and individual container capacities shall not exceed 6 gallons;

(8)Class 7, radioactive materials, transported in containers shall not exceed an aggregate quantity of 300 curies and the gross weight shall not exceed 500 pounds per vehicle and permission shall be obtained from the AHJ prior to entering a road tunnel;

(9)Class 8, corrosive materials, transported in containers shall not exceed an aggregate quantity of 120 gallons or 900 pounds per vehicle and individual container capacities shall not exceed 60 gallons;
(10)Class 9, miscellaneous hazardous materials, except oils, N.O.S., with a flash-point not less than 93°C/200°F transported in containers shall not exceed an aggregate quantity of 250 gallons or 2000 pounds per vehicle and individual container capacities shall not exceed 60 gallons containers.

13.1.6 Alternative-fuel vehicles powered by liquefied petroleum gas (LPG), liquefied natural gas (LNG) or compressed natural gas (CNG) shall be permitted if the:

(1) Vehicle has a dedicated alternative-fuel system installed by the manufacturer of the vehicle

(2) Vehicle has a fuel system which has been properly converted to an alternative fuel system.

(3) Vehicle alternative-fuel system conforms to applicable industry standards, including:

(a) NFPA 52 - Standard for Compressed Natural Gas (CNG) Vehicular Fuel Systems, which is incorporated by reference; or

(b) NFPA 58 - Standard for the Storage and Handling of Liquefied Petroleum Gases (LPG), which is incorporated by reference.

(4) Vehicle alternative-fuel system conforms to applicable federal regulations.

(5) Fuel capacity of the vehicle does not exceed 300 pounds water capacity.

13.1.6.1 Alternative-fuel vehicles shall display all markings and symbols required by law to identify the alternative-fuel system.

A new subsection A.13.1 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is adopted to read as follows:

A.13.1 Hazardous Material. A substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation for the United States Department of Transportation (U.S.D.O.T.) to be capable of posing an unreasonable risk to health, safety and property when transported in commerce and which has been so designated.

A new TABLE A.13.1.2 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is adopted to read as follows:

TABLE A.13.1.2

The following classes of hazardous materials are defined in the United States Department of Transportation Regulations, 49 CFR 173, which is incorporated by reference:			
Name of Class or Division	Class Number	Division Number (if any)	49 CFR Reference for Definitions
Explosives (with a mass explosion hazard)	1	1.1	173.50
Explosives (with a projection hazard)	1	1.2	173.50
Explosives (with predominantly a fire hazard)	1	1.3	173.50
Explosives (with no significant blast hazard)	1	1.4	173.50
Very insensitive explosives; blasting agents	1	1.5	173.50
Extremely insensitive detonating substances	1	1.6	173.50
Flammable gas	2	2.1	173.115
Nonflammable compressed gas	2	2.2	173.115
Poisonous gas	2	2.3	173.115
Flammable and combustible liquid	3	---	173.120
Flammable solid	4	4.1	173.124
Spontaneously combustible materials	4	4.2	173.124
Dangerous when wet material	4	4.3	173.124
Oxidizers	5	5.1	173.127
Organic peroxides	5	5.2	173.128
Poisonous materials	6	6.1	173.132
Infectious substances (Etiological agents)	6	6.2	173.134
Radioactive materials	7	---	173.403
Corrosive materials	8	---	173.136
Miscellaneous hazardous materials	9	---	173.140
Other regulated materials: ORM-D	None	---	173.144

A new subsection A.13.1.3 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is adopted to read as follows:

A13.1.3 *See Table A.13.1.2*

A new subsection A.13.1.5 of the National Fire Protection Standard 502 for Road Tunnels, Bridges, and other Limited Access Highways, 2001 edition, is adopted to read as follows:

A13.1.5 See Table A.13.1.2

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